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**FAX COVER SHEET**

To: Examiner Peter Lish  
Firm: Art Unit 1754  
Fax No.: 703-305-6078  
Comments:

From: Phillip Decker  
Date: September 15, 2003  
Pages (including cover): 6

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**


In re Application of: Joanna L. Duncan,  
Christopher R. McLarnon, and Francis R. Alix  
Serial No.: 09/683,267  
Confirmation No.: 3355  
Filed: 12/06/2001  
For: NOx, Hg, AND SO2 REMOVAL USING  
AMMONIA

] Examiner: Peter Lish  
]  
] Group Art Unit: 1754  
]

Commissioner for Patents  
P.O. Box 1450  
Arlington, VA 22313-1450

Dear Sir:


This correspondence is to supply replacement claim sheets, pages 2 - 6 of the Applicants' amendment of 8/26/2003. These replacement sheets are provided at the suggestion of the Office who advised the Applicants that the claims were not submitted in accordance with the new amendment format.

  
Phillip E. Decker  
Attorney for Applicants

**CERTIFICATE OF TRANSMISSION**

I hereby certify that this correspondence is being facsimile transmitted to the Commissioner for Patents (Fax No. 703-305-6078) on September 15, 2003.

Typed or printed name of person signing this certificate: Phillip E. Decker.

Signature: 

1. (currently amended) A process for removing SO<sub>2</sub>, NO, and NO<sub>2</sub> from a gas stream comprising the steps of

- a. oxidizing at least a portion of NO in a gas stream to NO<sub>2</sub> with an oxidizing means resulting in a mole ratio of SO<sub>2</sub> to NO<sub>2</sub> of at least 2.5 to 1, followed by
- b. scrubbing at least a portion of SO<sub>2</sub>, NO, and NO<sub>2</sub> from the gas stream with a scrubbing solution  
comprising ammonia, and  
having a pH between 6 and 8, and
- c. removing at least a portion of any ammonia aerosols generated from the scrubbing step from the gas stream with an aerosol removal means.

2. (original) The process of claim 1, wherein said oxidizing means is an electrical discharge reactor.

3. (original) The process of claim 2, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.

4. (original) The process of claim 3, further comprising the step of oxidizing at least a portion of the NO to HNO<sub>3</sub> with said dielectric barrier discharge reactor.

5. (canceled)

6. (original) The process of claim 1, wherein said oxidizing step is adapted to result in a mole ratio of  $\text{SO}_2$  to  $\text{NO}_2$  of at least four to one.
7. (original) The process of claim 1, said scrubbing solution  
comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and  
having a pH between 6 and 8.
8. (original) The process of claim 1, wherein said aerosol removal means is a wet electrostatic precipitator.
9. (original) The process of claim 1, wherein said scrubbing step results in the formation of ammonium sulfate, the process further comprising the step of withdrawing ammonium sulfate from the scrubbing solution.
10. (original) The process of claim 4, wherein said scrubbing step results in the formation of ammonium nitrate, the process further comprising the step of withdrawing ammonium nitrate from the scrubbing solution.
11. (original) A process for removing  $\text{SO}_2$ , NO,  $\text{NO}_2$ , and Hg from a gas stream comprising the steps of
  - a. oxidizing at least a portion of the NO in a gas stream to  $\text{NO}_2$ , and at least a portion of the Hg in a gas stream to  $\text{HgO}$ , with an oxidizing means, followed by

- b. scrubbing at least a portion of the SO<sub>2</sub>, NO, and NO<sub>2</sub> from the gas stream with a scrubbing solution
    - comprising ammonia, and
    - having a pH between 6 and 8, and
  - c. removing at least a portion of any ammonia aerosols generated from the scrubbing step, and HgO, from the gas stream with an aerosol removal means.
- 12. (original) The process of claim 11, wherein said oxidizing means is an electrical discharge reactor.
- 13. (original) The process of claim 12, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.
- 14. (original) The process of claim 11, wherein said aerosol removal means is a wet electrostatic precipitator.
- 15. (original) The process of claim 11, said scrubbing solution
  - comprising ammonia, ammonium sulfite, ammonium sulfate, and water, and
  - having a pH between 6 and 8.

16. (original) The process of claim 15, wherein said scrubbing step results in the formation of ammonium sulfate, the process further comprising the step of withdrawing ammonium sulfate from the scrubbing solution.

17. (withdrawn)

18. (withdrawn)

19. (withdrawn)

20. (withdrawn)

21. (withdrawn)

22. (withdrawn)

23. (withdrawn)

24. (withdrawn)

25. (withdrawn)

26. (withdrawn)

27. (withdrawn)

28. (withdrawn)

29. (withdrawn)